Information for Health Care Providers - Managing Contacts of Patients with Invasive Meningococcal Disease

How is meningococcus spread?

Meningococcus is spread through direct exposure to secretions (sharing saliva or sharing nasal secretions) or very close personal contact such as that occurring in households, daycare centers, jails, or barracks. It is *not* spread through casual contact such as that occurring in workplaces or classrooms.

What is the clinical manifestation of invasive meningococcal disease?

Invasive infection usually results in meningococcemia, meningitis, or both. Onset often is abrupt in meningococcemia, with fever, chills, malaise, prostration, and a rash that initially can be macular, maculopapular, or petechial. The progression of disease often is rapid. In fulminant cases (Waterhouse-Friderichsen syndrome), purpura, disseminated intravascular coagulation, shock, coma, and death can ensue despite appropriate therapy. Less common manifestations include pneumonia, febrile occult bacteremia, conjunctivitis, and chronic meningococcemia.

The clinical manifestations of meningococcal meningitis are indistinguishable from clinical manifestation of acute meningitis caused by *Streptococcus pneumoniae* or other meningeal pathogens. The case fatality rate for meningococcal disease in all ages remains at 10%; mortality in adolescents approaches 25%. Invasive meningococcal infections can be complicated by arthritis, myocarditis, pericarditis, and endophthalmitis. Sequelae associated with meningococcal disease occur in 11% to 19% of patients and include hearing loss, neurologic disability, digit or limb amputations, and skin scarring.

What are the diagnostic tests for meningococcal infection?

Cultures of *Neisseria meningitidis* from a normally sterile site such as blood, cerebrospinal fluid (CSF), synovial, pleural, or pericardial fluid, or skin scrapings or purpuric lesions are indicated for patients with suspected invasive meningococcal disease to confirm the diagnosis. The presence of gram-negative diplococci (detected by Gram stain) from a petechiae or purpuric scraping, or a normally sterile site such as blood or CSF does not confirm the presence of *N. meningitidis* in the site. Bacterial antigen detection in CSF supports the diagnosis of a probable case if the clinical illness is consistent with invasive meningococcal disease.

Who are most at-risk for developing invasive meningococcal disease?

The disease most often occurs in children younger than 5 years of age with the peak attack rate occurring in children younger than 1 year of age. Another peak occurs in adolescents 15 to 18 years of age. People who are most at-risk for developing invasive meningococcal disease are patients with terminal common complement deficiency (C5-C9), C3 or properdin deficiencies, or functional or anatomic asplenia; persons with HIV infection; freshman college students who live in domitories; household contacts of an infected person; person with antecedent upper respiratory tract infection; people who live in a crowded household; people who are both active and passive smoking; African Americans, persons of low socioeconomic status; and during outbreaks, bar or night club patronage and alcohol use. Microbiologists who are routinely exposed to isolates of *N meningitidis*; military recruits; and persons who travel to or reside in countries in which *N meningitidis* is hyperendemic or epidemic, particularly if contact with the local population will be prolonged are also at risk for the disease.

How should I handle an individual who thinks they have been exposed to meningococcal meningitis?

A close contact of an infected patient should receive the recommended chemoprophylaxis.

Only persons with close contact to a confirmed case of invasive meningococcal disease are at risk, such as:

- Household contact, especially young children
- Child care or nursery school contact during the previous seven days
- Direct exposure to index patient=s secretions through kissing or sharing toothbrushes or eating utensils, markers of close social contact
- Mouth-to-mouth resuscitation, unprotected contact during endotracheal intubation during the seven days before onset of illness
- Frequently sleeps or eats in the same dwelling as index patient during the seven days before the onset of illness
- Passengers seated directly next to the index case during

Chemoprophylaxis is *not* recommended for:

- Casual contact with no history of direct exposure to the index patient=s oral secretions, e.g. school or work mate
- Indirect contact: only contact is with a high-risk contact, no direct contact with the index patient
- Health care personnel without direct exposure to patient=s oral secretions

What medications are recommended for prophylaxis of contacts to a case of meningococcal meningitis?

Infants, children and adults	Dose	Duration	Efficacy, %	Cautions
Rifampin (age < 1 mo)	5 mg/kg body weight orally, every 12 hrs	2 days		
Rifampin (age ≥ 1 mo)	10 mg/kg body weight (maximum, 600 mg) orally every 12 hrs	2 days	90-95	Can interfere with efficacy of oral contraceptive and some seizure and anticoagulant medications; may stain soft contact lenses. **Not** recommended for pregnant women**.**
Ceftriaxone (age **<** 15 yrs)	125 mg intramuscularly	Single dose	90-95	To decrease pain at injection site, dilute with 1% lidocaine
Ceftriaxone (age ≥ 15 yrs)	250 mg intramuscularly	Single dose	90-95	To decrease pain at injection site, dilute with 1% lidocaine
Ciprofloxacin* (age ≥ 1 month)	20 mg/kg (maximum 500mg), orally	Single dose	90-95	**Not** recommended routinely for people < 18 years of age or pregnant women; use may be justified after assessment of risks and benefits for the individual patient
Azithromycin	10 mg/kg (maximum 500 mg)	Single dose	90	**Not** recommended routinely. Equivalent to rifampin for eradication of N. meningitides from nasopharynx in one study.

**Use only if fluoroquinolone-resistant strains of N. meningitides have not been identified in the community; CDC. Emergence of fluoroquinolone-resistant N. meningitides- Minnesota and North Dakota, 2007-2008. MMWR Morb Mortal Wkly Rep. 2008; 57(7):173-175. Source: Prevention and Control of Meningococcal Disease: Recommendations of the Advisory Committee on Immunization Practices (ACIP) MMWR, May 27, 2005, Vol. 54, No. RR-7, and the American Academy of Pediatrics Redbook@, 28th (2009) Edition.*

How are outbreaks/clusters of meningococcal infection handled?

In the state of West Virginia, local health departments practice readiness for meningococcal outbreaks on an ongoing basis by:

- Assuring that all meningococcal isolates are referred to the Office of Laboratory Services for serogrouping (to determine if circulating strains are covered by the meningococcal vaccine);
- Assuring that all high-risk contacts are appropriately offered prophylaxis; and
- Assuring that providers are educated to report suspect and confirmed cases of invasive meningococcal disease promptly.

Guidelines for outbreak management have been developed by the Centers for Disease Control and Prevention (MMWR, 1997; Vol 46, No. RR-5); however, each situation is different. Consult your local health department if a cluster or outbreak is suspected.

Are there vaccines for meningococcus?

A new tetravalent meningococcal conjugate vaccine (MCV4) is protective against meningococcal serogroup A, C, Y and W-135, and is recommended for:

- All children at aged 11-18;
- All college freshmen living in a dormitory;
- Other persons 19-55 years of age at increased risk of invasive meningococcal disease such as:
  - Travelers to or residents or countries in which meningococcal disease is hyperendemic or epidemic,
  - Children who have terminal complement component deficiencies (C5-C9) or properdin deficiencies,
  - Children who have anatomic or functional asplenia,
  - Military recruits,
  - Microbiologists routinely exposed to *N meningitidis*.

Meningococcal Polysaccharide vaccine (MPSV) is also available for persons ≥2 years of age but it is not recommended for routine vaccination of civilians. MPSV vaccine should be used only for persons 2 years and older who are at increased risk of *N. meningitidis* infection if MCV4 is not available.

How can I educate my patients about meningococcal infections?

Information about meningococcal disease is available from your local health department or on the West Virginia Department of Health and Human Resources website at:
http://www.wvdhhr.org/idep/pdfs/idep/meningococcal_disease_invasive/meningo_faq_public.pdf

References:

- Red Book® 2009 Report of the Committee on Infectious Diseases, 28th Edition. American Academy of Pediatrics.